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DECLARATION

I, Suzanne F. Gagliardi, declare that I am certified by the American Translators Association as a translator of German into English and that I have carefully made the attached English language translation from the original document:

German Patent Application no. 100 53 331.0 filed on October 27, 2000 at the German Patent Office, entitled

Verfahren und Informationssystem zur Überprüfung
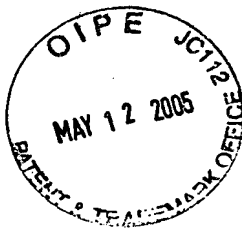von elektronischen Lieferschein- und Tranportdaten

[METHOD AND INFORMATION SYSTEM FOR VERIFYING
ELECTRONIC SHIPPING-VOUCHER AND SHIPPING DATA]

written in German; and that the attached translation is an accurate English version of such original to the best of my knowledge and belief.

Date: April 19th, 2005   Signature: _Suzanne F. Gagliardi_

METHOD AND INFORMATION SYSTEM FOR VERIFYING
ELECTRONIC SHIPPING-VOUCHER AND SHIPPING DATA

The present invention is directed to a method for verifying
electronic shipping-voucher **[delivery-note]** and shipping data,
sent by a sender **[forwarder or consignor]** to an information
system, as well as to an information system suited for this

5   purpose.

Most system providers, who manufacture complex products
[commodities], have at their disposal a wide network of
external vendor firms, who supply the system providers with

10   various resources in the form of raw materials, semifinished
products, components, and services. These resources are
ordered by the system provider – depending on the requirements
that arise – from the suppliers, and are delivered by the
suppliers at a point in time defined by the system provider,

15   to a location specified by the system provider, in one of the
manufacturing plants of the system provider. The delivery of a
particular order amount, i.e., the shipping of the goods to
which the order pertains, is accompanied by a shipping
voucher, i.e., by corresponding shipping information sent by

20   the supplier to the system provider. This shipping voucher,
i.e., the corresponding shipping information is sent within
the system provider firm to the plant or location where the
goods are to be delivered. In order for the goods to be
received **[for the consignment to be accepted]** at the proper

25   location, the data contained in the shipping vouchers or in
the shipping information must be error-free. The shipping
vouchers or the shipping information are largely provided as
electronic data records, whose format is defined by German or
international standards (e.g., VDA 4913 for shipping voucher

30   data, VDA 4921 for shipping data).

In one year, a typical system provider collects several
hundred thousand shipping vouchers and consignment notes
[waybills], which all need to be recorded, checked and
processed by the plant to which the goods are to be delivered.

5   If the shipping voucher or shipping data are incorrect, then
they must be corrected manually. This involves replacing
incorrect information or obtaining and adding missing
information, thereby necessitating substantial interactive
effort. If the received data are irreparable **[beyond**

10   **correction]**, then a receive report is drawn up, and the data
are stored as unusable **[data]**. The consequence is that, in the
case of a delivery, important information pertaining to this
delivery is missing, which may lead to considerable extra
expenses, and time delays (e.g., due to misallocation of the

15   delivered goods).

The underlying object of the present invention is, therefore,
to devise a method and an information system which will make
it possible to substantially reduce the outlay **[extra work]**

20   entailed in checking and correcting electronic shipping
voucher and shipping data.

This objective is achieved in accordance with the present
invention by the features of Claims 1 and 5.

25

Accordingly, the electronic shipping-voucher and shipping-data
records sent by a supplier and received by the system provider
are first checked by an information system for the presence or
absence of errors. If a data record is classified as being

30   error-free, it is then routed to a company **[in-house]** receiver
(e.g., to the section of the plant where the goods were
intended to be delivered). If, on the other hand, the data
record is faulty, it is then stored in a defined access area
of the information system, where it may be examined by the

35   sender (i.e., by the supplier in question) and revised. The
supplier may examine the defined access area to obtain a

check-back indication, on-line, as to whether the data sent by him is classified as incorrect; in addition, he has the possibility of revising this incorrect data himself.

5   At the core of the present invention is the crucial realization that, as a general rule, it is substantially more difficult and expensive for the system provider to correct a faulty shipping-voucher or shipping-data record than it is for the supplier, who created and sent this faulty data record.
10   Thus, the faulty data records may be corrected much more quickly and effectively, in so far as these data records are able to be reflected back [relayed], on-line, to the supplier, and the supplier's corrections are able to be inserted into the data record on-line. Thus, the system provider may realize
15   substantial savings (because the need is eliminated for manually correcting the data records, as is the corresponding outlay for obtaining information); on the other hand, the supplier receives comprehensive information about the legibility of the shipping voucher and shipping information
20   sent by him, from the system provider. This knowledge may be used by the supplier to analyze his internal procedures with respect to sources of error in creating the shipping-voucher and shipping-data records and, thus, to selectively reduce the error rate.
25

The automatic review that a data record sent by the supplier undergoes in the system provider's information system includes, first of all, once again, a verification that the sender is, in fact, authorized to send; furthermore, it is
30   checked whether the syntax of the transmitted data record conforms with the agreed-upon standard (e.g., VDA format). It is particularly advantageous when the data record may be further checked for conformity with a purchase order, sent by a system provider, who had initiated this delivery, to the
35   supplier in question (see Claim 2). This requires that the information system be provided with an interface to a database of the system provider, in which the order information is

electronically stored (see Claim 6). The order information
checked using the information system expediently includes the
article number and quantity of the goods to be delivered, the
delivery location, etc., in short, all information which
5   ensures a frictionless receipt of the goods to be delivered at
the receiving location of the system provider.

The incoming shipping voucher and shipping data may be checked
for errors within the system provider's plant environment at a
10   plant or area-of-operations level; this means that each plant
or each area of operations runs its own information system,
with whose assistance, the shipping voucher and shipping data
relevant to this plant or this area of operations are checked,
and the faulty data being collecting in this information
15   system are reflected back **[relayed]** to the supplier. Much more
beneficial is, however, performing this verification on a
firm-spanning central information system of the system
provider, on which all shipping-voucher and shipping data
concerning the system provider are checked and displayed –
20   independently of the plant or area of operations that they
[the data] pertain to (see Claim 3). This has the advantage,
on the one hand, of enabling the supplier to inspect all
faulty data records sent by him to various plants or areas of
operation of the system provider, at one single location –
25   namely the defined access area of the central information
system –, instead of having to search for these data in a
combination of various information systems. On the other hand,
it has the advantage of enabling the system provider to
evaluate all faulty data records relevant to one specific
30   supplier, at one central location (see Claim 4). From this,
profiles of the quality of the data sent by the supplier may
be generated and used, in cooperation with the supplier, as a
basis for developing measures for improving the quality of the
data.
35

The supplier's access to the defined access area of the
information system that concerns him expediently takes place

over the Internet (see Claim 7): The supplier may log onto the system provider's information system via a password or a user portal to obtain access (read and write rights) for that defined access area in which the faulty data sent by him are
5   stored.

In addition, it is advantageous to allow the system provider's plants or areas of operation, which are receiving the goods, to inspect the faulty data contained in the defined access
10   areas of the central information system (see Claim 8). It can happen, namely, that goods are delivered before the corresponding electronic shipping voucher or shipping data stored in the access area are able to be corrected by the supplier; should such a necessity arise, the plant or area of
15   operations receiving the delivery may examine the defined access area corresponding to this supplier, download the faulty electronic shipping voucher or shipping data relevant to this delivery, manually correct it, and assign it to the delivery that has arrived.
20
The present invention is elucidated in the following, in light of an exemplary embodiment illustrated in the drawing, whose figures show:

25   Figure 1   a schematic representation of an information network
                  between a system provider and suppliers;

       Figure 2   a schematic flow chart describing verification of a
                  shipping voucher or shipping data record;
30
       Figure 3   screen displays of an operator interface, which may
                  be examined by the supplier, of an information
                  system for shipping voucher and shipping data:
                  Figure 3a overview of the transmitted data;
35   Figure 3b mask for revising faulty data;
                  Figure 3c illustration of the performance
                         [characteristics].

Figure 1 schematically depicts an information network 1
between a system provider 2 and a plurality of suppliers 3,3'.
It is used to prepare and further process shipping-voucher and
shipping data. Suppliers 3,3' send shipping-voucher and

5   shipping data in electronic form (indicated by arrows 4 in
Figure 1) to system provider 2. For this reason, suppliers
3,3' are also referred to in the following as "senders" 4.
Both the electronic shipping vouchers, as well as the
electronic shipping information are provided in a standardized

10   format (e.g., VDA 4913 or VDA 4921).

The incoming data are routed to a central information system 6
of system provider 2 and, there, checked by a test program;
this is shown in the schematic flow chart of Figure 2. In a

15   first step 7, it is checked whether the sender of this data
record (i.e., supplier 3,3' in question) is authorized to
send; if this is not the case, the relevant data record is
provided with an error code. In a further step 8, the syntax
of the transmitted data record is checked to verify conformity

20   with the agreed upon standard (e.g., VDA format). If the data
record does not meet these requirements, it is classified as
faulty, and provided with an error code characterizing this
error. If the data record does conform with the VDA standard,
then the information content of the data record may be

25   interpreted, and the information contained therein is checked
in a further review step 9 for its consistency with an order.
To this end, central information system 6 accesses a database
10 having master data in which are centrally stored the orders
executed by system provider 2. This database 10 is searched to

30   find an order which matches the information contained in the
electronic shipping voucher with respect to the order number,
the type and quantity of goods to be delivered, and the
delivery location, etc. of the delivery. If no such order is
found, then the shipping voucher in question is classified as

35   faulty and is provided with an appropriate error code. If
desired, the received shipping voucher or shipping data may be
subjected to further checks to determine whether the data

record in question is classified as faulty or error-free. The specific error codes are stored in a database 11 which central information system 6 has access to.

5   If the shipping voucher or shipping data record is classified as being faulty [**erroneous**] in all review steps 7,8,9, the data record is then sent to a receiver 12 in that plant 13 and/or that area of operations which, upon arrival, accepts the goods or allocates them to an account (this is indicated

10   in Figure 2 by arrows 14). It is, thus, ensured that, in this plant 13 or area of operations, an error-free data record is at hand, which clearly describes the expected delivery and which may be assigned to this delivery by the processors [**originators**] in this plant 13 or area of operations when the

15   goods are received. Since the data record is free of errors, no further (manual or interactive) processing of the data record is necessary in plants 13 or in the areas of operation.

      If the shipping-voucher or shipping-data record is classified

20   as being faulty in some test [**validation**] station 7,8,9, then the data record is stored in a defined access area 15 of central information system 6. All faulty data records relevant to a specific supplier 3' are stored, in the process, in a defined access area 15' assigned to this supplier 3'. Supplier

25   3' is granted access rights to the defined access area 15', in central information system 6, so that he may inspect and revise the data stored in this area 15'. This access is expediently carried out over the Internet: For this, a supplier 3,3' logs onto a home page configured for this

30   purpose, for example, or onto an Internet portal of system provider 2, from where he arrives - by entering a password - at defined access area 15,15', appropriate for him; this is indicated in Figure 1 by arrows, 16,16'. Supplier 3,3' is able to view a display of the data records which are stored there

35   and identified as faulty (and possibly provided with an error code designating the type of error); supplier 3,3' may modify

or correct each of these data records. Once a revision is made
to a data record, this data record is again subjected to the
verification sequence of Figure 2; if, at this point, it is
classified as error-free, then - as described above - it is
relayed to an appropriate plant 13 or area of operations; if
it is still faulty, it is then stored, in turn, in defined
access area 15,15' assigned to this supplier 3,3', so that a
renewed correction may be made by supplier 3,3'.

Figures 3a through 3c illustrate an example of an
implementation of an operator interface 17a,17b,17c, which
enables a supplier 3' ("test vendor"), who used a password to
arrive at this operator interface 17a,17b,17c, to examine and
revise the information of his defined access area 15'. The
representation of Figure 3a shows a schedule of those data
records 18,18',18", which supplier 3' ("test vendor"), named
in data field 19, had sent to system provider 2 in the time
period displayed in data field 20 and which are designated for
plant 13 ("Berlin") indicated in data field 21. These are
three data records 18,18',18", of which two (18',18") were
classified as error-free (i.e., status "OK" in data field 22),
while a data record 18 was classified as faulty (i.e., status
"ERROR" in data field 22). For each data record, an internal
reference number is given in a data field 23, and the send and
receive information is given in data field 24.

Each data record 18,18',18" may be individually selected by
supplier 3' ("test vendor"); in this manner, supplier 3'
arrives at operator interface 17b (Figure 3b), in which
detailed information is displayed with respect to selected
data record 18. In the example at hand, it is indicated in
data field 25 that selected data record 18 contains a syntax
error; the corresponding error code is indicated in data field
26. By selecting control button 27 ("correct data"), the
supplier arrives in a mode where he may implement changes to
the displayed data record 18. Once these revisions are made,
he may once again forward modified data record 18 by selecting

control button 28 ("send data") to central information system 6, where - as described above - data record 18 is once again checked.

5   To evaluate the performance of a supplier 3' with respect to the error rate of the data sent by him, the number of faulty data records 18 of this supplier 3' are calculated in relation to the total number of data records sent by this supplier. In addition, the error rate may be analyzed in the various error
10   categories (syntax errors with respect to VDA standard, errors of content, etc.). Periodically updating these error rates enables one to visualize "improvements" or "deteriorations" in the supplier's performance. An example of such a screen display 17c is shown in Figure 3c.
15
If the faulty **[erroneous]** shipping-voucher or shipping-data records 18 stored in defined access areas 15,15' are not corrected quickly enough by suppliers 3,3', then it can happen that the delivery associated with this data record arrives in
20   the receiving plant 13 or area of operations, before a corrected data record can be sent by the central information system 6 to the involved plant 13 or area of operations. In such a case, in order to have rapid access to a data record describing this delivery - even if it be faulty -, plants 13
25   or the area of operation expediently have access rights to defined access area 15,15' of the suppliers (indicated in Figure 1 by the dotted-line arrows 29). In this manner, when such a necessity arises, the faulty shipping-voucher or shipping data records may be inspected in access area 15,15'
30   of plants 13 or areas of operation, and the (faulty) data record which corresponds to the current delivery may be searched **[picked]** out manually.

In the interest of having an effective interaction with the
35   suppliers and a company-wide, clear and concise display of the faulty data records, for one system provider 2 - as shown in Figure 1 - it is practical to provide only one single central

information system 6, in which faulty data records 18
accumulated over all plants 13, may be checked, managed, and
viewed. Alternatively, however, one may also move the central
information system to the plant level, thereby giving each
5   plant 13 or area of operations its own central information
system.

The method of the present invention and the system of the
present invention are especially suited - as described - for
10   exchanging shipping-voucher and shipping data between
suppliers and a system provider. In another context, however,
the method and the information system are also suited for use
in any processes where a plurality of partners interact by
exchanging electronic information, the possibility existing
15   that the exchanged data are faulty.

What is claimed is:

1. A method for verifying electronic data records containing
    electronic shipping-voucher and/or shipping data, which
    are sent by a sender **[forwarder or consignor]** to an
    information system,
    characterized by the following method steps:
    -   the information system (6) receives the electronic
        data record;
    -   the data record is checked by the information system
        (6) for the presence of errors;
    -   if the data record (18,18") is error-free, it is
        then routed to a receiver (13);
    -   if the data record (18) is faulty, it is then stored
        in a defined access area (15) of the information
        system (6), where it may be examined by the sender
        (5,3) and revised.

2. The method as recited in Claim 1,
    wherein when verifying the data record, ordering
    information stored in a database (10) is used to adjust
    the information of the data record.

2. The method as recited in Claim 1,
    wherein the verification of the data is performed for a
    plurality of plants (13) and/or areas of plant operation
    of a system provider (2), jointly at one central
    location.

3. The method as recited in Claim 1,
    wherein the number and type of errors of faulty data
    records (18) contained in the defined access area (15)
    are analyzed with respect to their development over time,
    and this information is displayed in the defined access
    area (15).

5.   An information system for verifying electronic data
      records containing electronic shipping-voucher and/or
      shipping data, which are sent by a sender **[forwarder or
      consignor]** (3,5) to the information system (6),
      comprising
      -    an interface for receiving a transmitted electronic
           data record;
      -    a processing unit for recognizing a faulty data
           record (18);
      -    a defined access area (15) for storing the faulty
           data record (18), the data records (18,18',18")
           contained in this access area being able to be
           inspected and revised by the sender (3,5); and
      -    an interface for routing a faulty data record (18)
           to a receiver (13).

6.   The information system as recited in Claim 5,
      wherein the information system (6) includes an interface
      to a database (10) containing order information.

7.   The information system as recited in Claim 5,
      wherein the data records (18,18',18") contained in the
      defined access area (15) are able to be inspected and
      revised by the sender (3,5) over the Internet.

8.   The information system as recited in Claim 5,
      wherein the faulty data records (18) stored in the
      defined access area (15) of the information system (6)
      are able to be inspected by the receiver (13).

Abstract

The present invention is directed to a method and an information system for verifying electronic shipping-voucher and shipping data sent by a sender (in particular a supplier) to a receiver (in particular a system provider or a plant). Faulty data records are automatically detected **[recognized]** and displayed in a defined access area of a central information system. The sender is able to inspect this defined access area, which contains the faulty data records sent by him, and modify the data records it contains. In this manner, the sender receives, on-line, a check-back indication **[acknowledgment]** of the quality of the data records sent by him, and, if indicated, is able to make a correction. The sender's access to his defined access area expediently takes place over the Internet.

Translation Key to Figures

Figure 1

6	central information system
11	error codes
10	master data

Figure 2

11	error codes
10	ordering information

Flow chart:

data record

sender authorized?   no

    yes

compatible with VDA data?   no   storing of the data record
                                        in the defined access area

    yes

compatible with ordering   no
information?

    yes

    plant

Translation key to Figure 3a (screen shot)

EDIweb	Search	What's new	Content	Interactive	Help	English

Supply Portal	Data sender / Vendor
Supply Current	**Test vendor**
General	Data receiver / Plant
Supply information	**Plant Berlin**
Applications:	Selection time period
	4/5/2000 to 4/20/2000 5:00 am – 8:00 pm
LS determination according to VDA	Shipment – Lading

		Shipment		Receive	
LS-DFU quality Shipment overview Shipment information	Shipment status	Reference number	Date	Time	Date	Time
Error correction Quality report	**ERROR**	57112	4/20/2000	7:15	4/20/2000	8:05
LS-DFU monitor	**OK**	57108	4/17/2000	6:45	4/17/2000	7:34
	OK	57101	4/5/2000	7:08	4/5/2000	7:56

15

Translation key to Figure 3b (screen shot)

EDIweb Search What's new Content Interactive Help English				
Data sender / Vendor				
Test vendor				
Data receiver / plant				
Plant Berlin				
Shipment – Lading	Shipment		Receive	
Reference number	Date	Time	Date	Time
Shipment status — 57112	4/20/2000	7:15	4/20/2000	8:05
ERROR — Sum of Errors	File/ Field		Description	
Error code — I11110	1	Data sender no.	Field content is not numerical	
4913 content				
Rows of number (see original)				
Correct data				
Send data				

Supply Portal
Supply Current
General
Supply information
Applications:
LS determination
according to VDA
LS-DFU quality
Shipment overview
Shipment information
Error correction
Quality report
LS-DFU monitor

Translation key to Figure 3c (screen shot)

	EDIweb Search What's new Content Interactive Help English
	Data quality of shipping voucher data according to VDA 4913
	Quality report of August 9, 2000
Supply Portal	Data sender / Vendor **Test vendor**
Supply Current	Data receiver / Plant **Plant Berlin**
General	Month of report July 2000
Supply information	Assessment:
Applications:	Data quality	Shipment capacity

	Previous month	Month of report	Tendency		Previous month	Month of Report	Tendency
LS determination according to VDA	Transmitted data records				Total positions		
LS-DFU quality Shipment overview	32,547	38,119			54,921	62,430	
Shipment information	Total errors				Positions per DFU		
Error correction Quality report	23,579	54.448			43,911	30,712	
LS-DFU monitor	Error quota				Shipment capacity		
	72.4 %	142.8 %			80.0 %	49.2 %	